STOCHASTIC MODELS IN COPPER PRICE UNCERTAINTY

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Abstract

We consider long range planning of copper mine extraction in an open pit mine, when uncertainty in copper future copper prices is considered. The uncertainty is expressed through price scenarios, a scenario being defined as a price for every period through the horizon. We discuss how scenarios can be built. The well known non-anticipativity constraints must be considered, which impose that if two scenarios are identical until period t, then all decisions in these two scenarios must be the same until period t (Wets and Rockafeller). Adding these constraints makes solving the problem difficult if many scenarios are defined. We use an algorithm, Progressive Hedging to solve these problems. In this algorithm the scenarios are solved separately in a penalized way, where penalties are modified in each iteration to reach convergence.

Key words: Stochastic models, mining, forestry,progressive hedging algorithm

Area OA: otras aplicaciones en PO